Amendments to the Claims:

This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims:

1-28. (Cancelled).

29. (Currently Amended) A method of performing communication in a two-hop wireless communication network, wherein a base station, at least one mobile station and a plurality of relay stations are engaged in, or in the process of establishing, a communication session, and wherein the relay stations forward signals from the ~~based~~ base station to the at least one mobile station, said plurality of relay stations having at least partially overlapping coverage, said method comprising the steps of:

establishing by said at least one mobile station a soft association to said plurality of relay stations by internally selecting a set of relay channels from said number of relay stations, said set of relay channels associated to the relay stations being candidates for use in the communication session;

feeding back from the at least one mobile station, during the communication session, information on the communication quality to the base station; and,

adapting in the base station the transmission to at least one of the relay stations which the mobile station has soft association with, in response to the communication quality feedback from the at least one mobile station.

30. (Previously Presented) The method according to claim 29, for a specific mobile station, wherein the step of selecting comprises the substep of the mobile station measuring the relay channel quality of said plurality of relay stations of the relay cluster.

31. (Previously Presented) The method according to claim 30, wherein, in the step of measuring, the mobile station measures on pilots sent by the at least one relay station.

32. (Previously Presented) The method according to claim 30, wherein, in the step of measuring, the mobile station measures on pilots sent by the base station and forwarded by the at least one relay station.

33. (Previously Presented) The method according to claim 30, wherein the step of selecting comprises the further steps of:

the mobile station determining bandwidth requirements based on a current application executed in the mobile station or anticipated future applications; and,

said selection is based both on the relay channel quality measurements and the bandwidth requirements.

34. (Previously Presented) The method according to claim 29, wherein the step of selecting is repeated during the communication session in order to adapt to changing conditions in the radio environment.

35. (Previously Presented) The method according to claim 29, wherein the method comprises the further steps of:

at least one mobile station, during the communication session, feeding back information on the communication quality to the base station; and,

the base station further adapting the transmission to at least one of the relay stations which the mobile station has soft association with, in response to the communication quality feedback from the at least one mobile station.

36. (Previously Presented) The method according to claim 29, wherein the step of the base station adapting the transmission comprises the further substeps, to be performed by the base station, of:

identifying from the feedback conflicting demands from at least two mobile stations regarding the usage of at least one relay station, said two mobile stations having soft association to the same as least one relay station;

initiating an optimization process for resolving the conflicting demands; and,

adapting the transmission at least to the relay stations to which the two mobile stations have soft association, taking into account the result of the optimization process.

37. (Previously Presented) The method according to claim 35, wherein the step of feeding back comprises the step of said mobile station feeding back raw channel state information to the base station.

38. (Previously Presented) The method according to claim 35, wherein the step of feeding back comprises the step of said mobile station feeding back processed channel state information to the base station.

39. (Previously Presented) The method according to claim 38, wherein the step of feeding back comprises the step of said mobile station feeding back any of, or any combination of, the following parameters to the base station: link mode, coding scheme, modulation scheme and antenna transmit weights.

40. (Previously Presented) The method according to claim 29, wherein the method comprises MIMO based communication between the transmitter and the relay stations.

41. (Previously Presented) The method according to claim 40, wherein the transmitter of a base station sends a vector **T** over channel matrix **H**, where each row of the matrix **H** corresponds to one or more relay stations using the same forwarding relay channel, and the matrix **H** comprises as many rows as there are relay forwarding channels.

42. (Previously Presented) The method according to claim 40, wherein the transmitter of a base station sends a vector **T** over channel matrix **H**, where each row of the matrix **H** corresponds to one or more relay stations using the same forwarding relay channel, and there are at least two forwarding relay channels.

43. (Previously Presented) The method according to claim 40, wherein the transmitter of the base station uses singular value decomposition of the channel matrix **H** and applies a unitary weight matrix (**U**) to the outputted signal to facilitate a diagonalization with the use of the Hermitian of a unitary weight matrix (**V**).

44. (Previously Presented) The method according to claim 40, wherein singular value decomposition (SVD) is used and the method comprises the steps of:

the transmitter of a base station sending a vector **T** over channel matrix **H**, where each row corresponds to one or more relay stations using the same relay channel and there are as many relay channels as there are rows in the channel matrix, and applying a unitary weight matrix (**U**) to the outputted signal; and,

the receiver performing a diagonalization by multiplying the received signal with the Hermitian of a unitary weight matrix **V**, whereby the receiver is able to directly receive a number of parallel substantially self-interference free MIMO subchannels.

45. (Previously Presented) The method according to claim 29, wherein the method of performing communication is preceded by a process of organizing relay stations so that the channels of at least two neighbouring relay stations are essentially orthogonal and the coverage of the at least two neighbouring relay stations are arranged to have substantial overlap.

46. (Previously Presented) The method according to claim 45, wherein the overlap between the two neighbouring relay stations is above 10% of the coverage area of the relay station exhibiting the smallest coverage area.

47. (Previously Presented) A system adapted for communication in a two-hop wireless communication network, wherein the network comprises at least a base station, at least one mobile station and a plurality of relay stations, wherein the relay stations are adapted to forwarding signals from the base station to the mobile station, at

least a portion of the plurality of relay stations are organized so that at least two neighbouring relay stations have substantially overlapping coverage, and the channels of the relay stations with overlapping coverage are essentially orthogonal; wherein:

at least one mobile station is operative to select a set of relay stations from the relay stations with at least partially overlapping coverage, thereby establishing soft association to a plurality of relay stations which are candidates to use in communication between the base station and the mobile station; and,

logical feedbacks between the mobile stations and the base station, wherein the logical feedbacks carries information usable by the base station to adapt transmit parameters for the transmission to the relay stations.

48. (Previously Presented) The system according to claim 47, wherein a plurality of mobile stations are arranged to select individual sets of relay stations from the portion of relay stations with at least partially overlapping coverage.

49. (Previously Presented) The system according to claim 47, wherein the forwarding performed at the relay stations during a communication session is not essentially dependent on control signalling directly between the mobile stations and the relay stations.

50. (Previously Presented) The system according to claim 47, wherein the logical feedback carries information on the set of soft associated relay stations for each mobile station.

51. (Previously Presented) A receiver adapted for use in a two-hop wireless communication network, wherein the network comprises a transmitter, a receiver and at least one relay station, wherein the relay station is adapted to forward signals from the transmitter to the receiver, said receiver comprising :

selecting means operative to select a set of relay stations from a plurality of relay stations with substantially overlapping coverage, said selecting means arranged to base the selection on relay channel quality;

feedback means operative to feed back the information on selected relays to the transmitter.

52. (Previously Presented) The receiver according to claim 51, wherein the feedback means comprises means for feeding back raw channel state information for each relay channel to the transmitter.

53. (Previously Presented) The receiver according to claim 51, wherein the feedback means comprises means for feeding back processed channel state information for each relay channel to the transmitter.

54. (Previously Presented) A base station adapted for use in a two-hop wireless communication network, wherein the network comprises a base station, at least one mobile station and at least one relay station, wherein the relay station is adapted to forwarding signals from the base station to the mobile station, the base station comprising:

means for receiving feedback from the mobile station on the transmission to the mobile station;

optimization means operative to identify conflicting demands from at least two mobile stations regarding the usage of at least one relay station, said two mobile stations having soft association to the same as least one relay station, and operative to perform an optimization process for resolving the conflicting demands;

transmission parameter adapting means operative to determine transmission parameters for the transmission at least to the relay stations to which the two mobile stations have soft association, taking into account the result of the optimization process.

55. (Previously Presented) The base station according to claim 54, wherein the transmitter of the base station is operative to perform MIMO based communication and sending a vector T over channel matrix H, where each row of the matrix H corresponds to one or more relay stations using the same relay channel and there are as many relay channels as there are rows in the channel matrix.

56. (Previously Presented) The base station according to claim 55, wherein the transmitter of the base station is operative to use singular value decomposition (SVD) and apply a unitary weight matrix (U) to the outputted signal to facilitate a diagonalization with the use of a Hermitian of a unitary weight matrix (V).

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